Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_ Per.: \_\_\_\_\_\_\_\_

**Shadows and Trigonometry**

**Phase 1: Data Collection**

|  |  |
| --- | --- |
| Time (ex: 9:14 AM) |  |
| Date |  |
| Height of Student (to the nearest 1/8 of an inch) |  |
| Length of Student’s Shadow (to the nearest 1/8 of an inch) |  |
| Length of the Building’s Shadow (to the nearest 1/8 of an inch) |  |

**Phase 2: Calculations**

In the labeled spaces, draw a diagram of the following AND label with the measurements you recorded in the table above:

1. how the student and the student’s shadow form a right triangle.
2. how the building and the building’s shadow form a right triangle.

1) Diagram: student and student’s shadow

2) Diagram: building and building’s shadow

Based on your diagrams, calculate the following, making sure to SHOW ALL STEPS!

1. Using your diagram in number one, find the measure of the angle formed by the height of the student and the hypotenuse.

1. Using your diagram in number two AND the angle you found in number three, find the height of the building in inches and then convert to feet. Round to the nearest foot.

**Phase 3: Analysis**

1. Are the triangles in #1 and #2 similar? Clearly explain why or why not. Use evidence from your measurements and diagrams.
2. How do the trigonometric ratios (sin, cos, tan) relate to similar triangles? (HINT: The sin of 750 is the same for any right triangle, no matter the size. Sin represents the ratio of the length of the opposite side to the length of the hypotenuse… opp/hyp).

1. How do you find an unknown side length in a right triangle? How do you find an unknown angle in a right triangle?
2. Name a career that would use trigonometry and explain why.

**Phase Four: Practice**











